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(54) **ON-DEMAND BEVERAGE COOLER**

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See application file for complete search history.

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(57) **ABSTRACT**

A beverage cooler (**10**, **100**, **200**) includes a heat pump (**12**) having a cooling element thermally coupled to a negative-heat-energy accumulator (**14**). The accumulator (**14**) includes a heat-energy dispersion arrangement (**16**) formed from thermally conductive material which is in thermal contact with a quantity of phase-change material (**18**) having a phase-change temperature above zero Celsius. A conduit (**20**) for the beverage defines a circuitous path thermally coupled to accumulator (**14**). The heat pump (**12**) draws heat energy predominantly from the phase-change material (**18**) so as to ensure that a temperature of the phase-change material is reduced by at least as much as the temperature of the beverage within conduit (**20**), even under zero-flow conditions. This ensures that the accumulator (**14**) can be fully charged during periods of low beverage dispensing demand without risk of freezing the beverage within conduit (**20**).

11 Claims, 12 Drawing Sheets